80. A method of obtaining embryogenic cells in plant material, comprising transforming the material with the vector of claim 56, and subjecting said material to a compound which acts as a ligand for the gene product of the said sequence.

81. A method of generating somatic embryos under *in vitro* conditions wherein a protein having the amino acid sequence depicted in SEQ ID No. 3, SEQ ID No. 21 or SEQ ID No. 33, or a protein having an amino acid sequence which is at least 90% similar thereto is overexpressed ectopically.

82. A bag containing the seeds as produced by the method of claim 61.

REMARKS

Applicants thank the Examiner for the thorough review of the application. Applicants have canceled claims 1-46 and substituted therefor new claims 47-82.

Applicants' above amendments to the Specification make the corrections required by the Examiner on page 2 of the Office Action.

Claim objections discussed on page 2 of the Examiner's Office Action were taken into account by Applicants and are overcome by new claims 47-82.

Claim 40 has been canceled. A recitation of use without setting forth method steps is not included in any of the new method claims. Thus, Applicants have overcome the Examiner's rejection of claim 40 under 35 USC 101.

Claim 16-30 and 34 stand rejected under 35 USC 101 because the Examiner states that the claimed invention was directed to non-statutory subject matter, because the claims read on DNA per se. Claims 16-30 and 34 are canceled, and Applicants did not include DNA per se claims in new claims 47-82, thereby overcoming said rejections.

Claim 1 and those claims that depended therefrom were rejected by the Examiner under 35 USC 112 for omitting essential steps in the method of the invention. The new method claims include the essential step of "collecting seeds."

Claim 10 and those claims that depended therefrom, and claims 21-24 were rejected under 35 USC 112, because the Examiner states in the August 1, 2000 Office Action that the recitation of "substantially similar" renders the claims indefinite. The above new claims do not

recite "substantially similar," but instead recite "at least 90% similar." Applicants respectfully submit that the language "at least 90% similar" is not indefinite.

Claim 1 and the claims that depended therefrom are rejected under 35 USC 112, second paragraph. The Examiner states that claim 1 is indefinite because it is not clear in what cell types the transgene is intended to be expressed to produce the apomictic seeds. Claim 1 has been canceled. The new method claim has overcome this rejection. Specifically, section (i) of claim 61 recites "transforming plant material with an expression vector according to claim 55 to express the encoded kinase in the vicinity of the embryo sac;". Applicants respectfully submit that the method claims now make clear in what cell types the transgene is intended to be expressed to produce the seeds of the invention and is not indefinite under 35 USC 112.

Claim 12 and its dependent claims were rejected for improper "Markush"-type claiming. Claim 12 is canceled. The new claims use a proper format for their "Markush" groups.

Claim 40 stands rejected for merely reciting a use without any active, positive steps delimiting how the use is actually practiced. Claim 40 is canceled. New method claims set forth active, positive method steps. Therefore, Applicants respectfully submit that the new method claims are not indefinite.

Claims 41 and 46 stand rejected under 35 USC 112, in view of the term "obtainable" used therein. Claims 41 and 46 are cancelled. New claims do not use the term "obtainable."

Claims 1 and 43 stand rejected under 35 USC 112, second paragraph, in view of the term "expressing" used therein. Claims 1 and 43 are canceled. The new claims do not use the term "expressing."

Claims 25-28 stand rejected under 35 USC 112, as the use of "stringent conditions" renders the claims indefinite. Claims 25-28 are canceled. New claims now recite the high stringency conditions required to exclude binding of non-specific or undesirable DNA sequences.

Claim 43 stands rejected under 35 USC 112, as the use of the term "derivatives" renders the claim indefinite. Claim 43 is canceled, and use of "derivatives" is not used in the new claims.

Applicants now respond to the 35 U.S.C. 112 rejections contained in paragraphs 19, 20, 21, 22, and 23 of the August 1, 2000 Office Action. Applicants respectfully submit that new claims 47-82 overcome the Examiner's rejections expressed in these paragraphs. First, method

claim 61 is drawn and limited to a method for producing "seeds of the adventitious embryony type" including transforming with a vector containing the particular DNA sequence claimed in claim 47. Adventitious embryony is supported on page 1 of the specification, where it is stated that "somatic embryos from surrounding cells invade the sexual ovary, one of the somatic embryos out-competes the other somatic embryos and the sexual embryo and utilizes the produced endosperm." The specification also teaches that the SERK receptor is mainly expressed in embryogenic cell cultures (see page 19, lines 24-26 of the specification), and that the expression of the SERK gene corresponds with the first appearance of competent cells during hypocotyls activation (page 20, line 22 to page 22 line 14) and in established embryogenic cell cultures. Also, FIG 2A shows that those cells on the surface of the explant that express the SERK genes on are the ones that become embryogenic, whereas those cells that do not express such genes do not become embryogenic. FIG. 5 further shows the 2200bp SERK luciferase construct effecting the number of developing ovules in the siliques of transformed plants. Thus, the specification describes the relationship between the expression of the SERK sequences as claimed and the formation of somatic embryos, which are known to invade the sexual ovary to allow for the formation of seed of the adventitious type. In view of the above-amended claims and remarks, Applicants respectfully submit that the specification shows that Applicants were in possession of the invention at the filing date of the subject application and that the application teaches those skilled in the art how to make and use the claimed invention.

Applicants have canceled all claims that are directed to any DNA sequence encoding a protein the presence of which in an active form in a cell, or membrane thereof. New independent claims 47 and 48 are limited to claiming SEQ ID NOS. 1, 3, 21, 33, 20 and 32, or amino proteins encoded thereby. Claims directed to SEQ ID NOS. 22-27, 29, and 31 are canceled. Thus, the amended claims are not drawn to a genus, i.e., to "any nucleic acid that minimally contains the recited sequence of sequence fragment."

The Examiner rejected 1-23, 25-27, 28-44, and 46 under 35 USC 112, asserting that claims to transforming any plant material with any nucleotide sequence encoding a protein which renders any plant cell embryogenic contain subject matter not described in the specification. Applicants respectfully disagree. See the immediately preceding paragraph for Applicants' remarks addressing the original claims being directed to any nucleotide sequence. With regard to any transformation of plant material, Applicants have transferred the claimed technology into

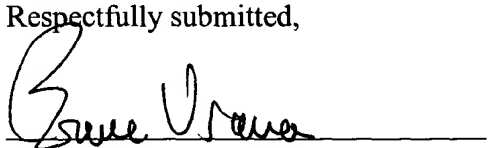
two significantly different plants, Arabidopsis and Daucus carota, supporting Applicants' claims to transformation of plants in general. Furthermore, the current state of transformation technology also provides for application of the claimed invention across different plant species and different plant materials without undue experimentation. (See pages 7 and 8 of the application.) With regard to employing the claimed invention with any cells, Applicants' argue that the claims are not drawn to just any cells, but to those cells that encode proteins expressed near the embryo sac. This clearly limits the types of cells covered by the new claims.

Finally, the method claims of the invention are directed to producing seeds of the adventitious embryony type, support for which is found on pages 20-23 and 31-34. See also Figure 2A, which shows that few cells on the surface of the explant express the SERK gene, but those that do are the ones that become embryogenic. FIG. 5 also shows how a 2200 bp SERK luciferase construct affects the number of developing ovules in the siliques of transformed plants. By increasing the number of developing ovules, the SERK gene is increasing the number of somatic embryos that will compete with the sexual embryo for utilization of the endosperm. Clearly, production of such competitive somatic embryos is an important and inventive step used for production of seed of the adventitious embryony type. Applicants thus respectfully submit that the specification describes a method for producing seeds of the adventitious embryony type such that one skilled in the art would recognize that at the time the application was filed Applicants had possession of the claimed invention.

New claims to particular sequences overcome the Examiner's rejection contained in paragraph 24 of the Office Action.

In view of the above amendments and remarks, it is submitted that the application is now ready for allowance. Early notice to this effect is now solicited. If any additional information is needed, the Examiner is invited to call the undersigned attorney at (919) 541-8614.

Respectfully submitted,



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